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which they are made effective may be likened to "trench cleaners" in modern warfare. Periodically the necessities of combat require that the trenches and the rear be freed of those who have not accepted the issue of battle. But the real line of advance—the shouting and the glory and the flag—are way out in front in No Man's Land and beyond.

It seems altogether possible that the engineer will play an increasingly important rôle in the immediate future. The Great War, with its lessons as to what can be accomplished through organization and the applications of science to the affairs of men, is still fresh in the minds of the peoples. There seems to be every incentive not only for the engineer to go forth to meet glorious opportunity but for the public to welcome him with open arms. But History is full of lost chances.

Given the excuse, a public in a surprisingly short time can grow lukewarm and even antagonistic. Civilization needs the "know how"—the constructive, creative mind—as never before.

The work ahead is one of producing world-wide effectiveness rather than individual or national profit, of cutting out waste rather than regimenting men. The engineer if he is to be equal to the task must approach it altogether from the service angle. To make us worthy and able for this task nothing will be of greater assistance than high standards of professional conduct—the higher the better. In fact the opportunity now knocking at our door will not be fully embraced until a deep spiritual relationship has been established between the engineer and a race set free.

The Ethics of the Mechanical Engineer

By CALVIN W. RICE

Secretary, American Society of Mechanical Engineers

IN the concept of his obligation to society, the mechanical engineer has always possessed an idealism, although it was not actually formulated until comparatively recent years. Whereas some of the organizations representing other branches of the engineering profession may have had codes of ethics, formally approved and recognized by their bodies at an earlier date than the first code of the American Society of Mechanical Engineers, it is inconceivable that with such founders as this Society possessed and with such engineers as have been included in its rolls of membership through practically the half century of its existence, the members of the Society have not taken on the ideals and motives of

these leaders as a guide for their professional conduct and in their relations to society. Men like Professor John E. Sweet, Alexander L. Holley, H. R. Worthington, Professor R. H. Thurston, its first president, all of whom were included among the founders of the Society, and men like Henry R. Towne and Captain Robert W. Hunt, fortunately still living, are all such recognized examples of practitioners of the highest ethical standards, that any organization fortunate enough to include their names within its membership must perforce adhere to high principles of ethical conduct or else such men would not continue as members. Such an organization must base all its transactions upon the

principle of the Golden Rule, which is after all, what a code of ethics really is.

The necessity for a joint code of ethics for all engineers arises from the fact that, unlike lawyers and doctors, engineers are not organized into one professional body. The engineering organizations now in existence have all evolved from small professional groups interested in specialties. The early meetings of these bodies were devoted to the discussion of papers within specific fields of engineering in contra-distinction to giving attention to the broad and general problems of the engineering profession. In those days, some half a century ago, the community of interests of the several kinds of engineers was not recognized since it was the habit for engineers to segregate into professional groups. Today the great national engineering societies are an important evolution of these groups and are organized along what have come to be the four main branches of engineering practice: civil, mining and metallurgical, mechanical and electrical.

Within the last few years, with the growing concept of the professional obligation within the engineering profession, a number of joint movements have developed, so that by the time the War came the sum total of co-operative and conjunctive activities of the engineering organizations had become very large. The War brought home to us all the essential principle of the obligation of the engineer to society, and since the War, with the complications of civilization still in progress, this sense of obligation has been accentuated until now the underlying ideal of the professional engineer is professional unity.

With the stage thus set, the American Society of Mechanical Engineers enthusiastically joined in the idea of a code of ethics in common for the engineering profession, and within the last year has

participated in steps to secure the formulation of a code which would be acceptable to all engineers. The subsequent recounting in this article of the progress of a code of ethics within the American Society of Mechanical Engineers, during the ten years prior to the inception of this joint code, will convey an idea of the difficulties still to be overcome. However, it is hoped that, with the great incentive of the need throughout the world for the resumption of progress, and with the realization that it is to America, free as she is from the results of the War, that the world is looking for leadership, these engineers who are leading the profession will be imbued with a new determination and a concentration of effort towards the realization of the ideals of the professional engineer.

THE MECHANICAL ENGINEER'S RESPONSIBILITY TO SOCIETY

The essential difference between a professional man and one skilled in any craft is the urge for his undertaking; that is whether it is simply a means of livelihood or whether it is the devotion of his talents to the common good, trusting that he will receive proper compensation. Assuming that the latter concept of the obligation of the mechanical engineer is accepted as the essential end for his professional career, then a code of ethics becomes necessary not only to assist the mechanical engineer in his conduct, but to acquaint the world with what it may expect from a professional man, thus rendering the profession, as such, stable and recognized by society.

HISTORY OF THE CODE OF ETHICS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Those who are familiar with the inner workings of the volunteer efforts of individuals within societies, not

alone professional, will appreciate the fact that only on very rare occasions and under some great incentive does an organization ever become single-minded and express itself as being so. Actions must necessarily be compromise actions; radically new policies are rarely attempted unless there has been previous deficiency, and a new policy is simply corrective of some form of weakness. In a professional society most of the members behave themselves most of the time and fortunately violations of the laws of professional conduct are exceedingly few and far between.

It is only when there is some flagrant violation of the code, and considerable publicity is given to the case that those members of the society most ethically minded wonder whether the principles of conduct for fellow members have been sufficiently prescribed and if they have not, whether it would not be advisable to revise the existing canons or to make new ones. Of course this kind of questioning does not take place very often until the standards of conduct have become fairly determined.

All the above is as a preamble to saying that it was not until about 1910, thirty years after its organization, that the attempt was made within the American Society of Mechanical Engineers to formulate a code of ethics. In January of that year the Council of the Society "approved the appointment of a Committee to consider respecting the advisability of the Society's preparing a code of ethics." A committee consisting of Mr. Charles Wallace Hunt, Dr. W. F. M. Goss, and Professor John E. Sweet was appointed. The discussion which led the Council to take its first action is not recorded, but a subsequent action is stated to have been taken:

Whereas, The Society is often addressed on the general subject, and *Whereas*, The

American Institute of Electrical Engineers have just adopted an admirable code of ethics:

Voted: That a Committee of three be appointed by the President to consider and report its recommendations to the next meeting of the Council.

The first Special Committee of three was later increased to five and its personnel changed to Charles Whiting Baker, Chairman, Charles T. Main, Colonel E. D. Meier, Spencer Miller and C. R. Richards. It was this augmented committee which in December, 1912, presented a report to the Council embodying a code of ethics.

The Council voted "to receive this report and publish it in the journal of the Society, with special emphasis on the suggestion of the Committee that the membership at large be invited to make suggestions and criticisms, to be sent to the Committee." It was also voted "that this report be made a matter of discussion by the Society as a whole at its semi-annual meeting held in Baltimore in 1913."

The proposed code was discussed at that meeting of the Society and the following action was taken:

Resolved: That it be recommended to the Council that the proposed code of ethics be printed in pamphlet form and a copy mailed to each member of the Society, accompanied by a ballot so prepared that each member may vote upon each clause separately; and that if the majority of those voting are in favor this meeting recommends that the Council shall declare the report approved and shall arrange for the appointment of a committee on the interpretation of the code.

The code was duly issued and submitted to letter ballot of the membership in October, 1913, and the ballot was favorable. The code was thereby adopted by the whole Society. Mr. Charles Whiting Baker, Chairman, Charles T. Main, Colonel E. D. Meier,

Spencer Miller and C. R. Richards, the original committee which formulated the code, were appointed a Committee on Interpretations.

THE FIRST CODE ADOPTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

An analysis of the first code of ethics of the American Society of Mechanical Engineers reveals the fact that its purport was chiefly admonitory. This code, which was not a code of principles so much as a code of recommended practices in specific cases and injunctions against performing specific acts of impropriety is reprinted on page 271 of this volume.

ATTEMPT AT A SECOND CODE

At the end of 1918 a wave of idealism swept through the United States and professional engineering societies made investigations of their activities in the light of their new concepts. In common with the other societies, the American Society of Mechanical Engineers appointed a special Committee on Aims and Organization which made recommendations concerning the Society's activities and also concerning the activities of a national engineering organization in connection with the community.

The report of this Committee consisted of a series of different recommendations, condensed to a minimum number of words and enumerated without very much preamble. The object of such a report was to focus attention on the most important activities to be developed and to avoid detail of discussion. The report of this Special Committee on Aims and Organization contained the following regarding the code of ethics:

RECOMMENDED: That it is the sense of this Committee that a short code of ethics of broad scope, general character

and positive rather than negative injunction, be prepared and that the same be enforced vigorously.

RECOMMENDED: That a Committee of five on Code of Ethics be nominated by the President and confirmed by the Council who shall report back to the Society at the Annual Meeting.

Upon the adoption of these recommendations by the Society, the Council appointed a new committee, consisting of Professor A. G. Christie, Chairman, Mr. Robert Sibley, J. V. Martenis, T. H. Hinchman, H. J. C. Hinchey and Charles T. Main, to prepare a new code, and to consider a means for enforcing it. This Committee reported to the Council on April 19, 1920 and the report was referred to the membership at the Spring Meeting of the Society in the following month.

The discussion at the Spring Meeting was extended and earnest, and the code was referred back to the Committee for restatement in the light of the discussion.

At the same time the Society recognized the recommendation of the Committee that a code should be common to each branch of the profession, and it was therefore offered to the other engineering societies for their consideration. This was the beginning of the efforts for a joint code which are still under way.

The Special Committee before revising the language of the code thought it well to take into consideration representatives of the other engineering societies and recommended the appointment of a Joint Committee. The civil, mining and metallurgical, and electrical engineers responded, as did also the American Society of Heating and Ventilating Engineers, and later the American Society of Refrigerating Engineers.

The representatives of the American

Society of Mechanical Engineers on this Joint Committee are expecting to present again the proposed code, revised in coöperation with the representatives of the other societies, at the forthcoming Spring Meeting of the Society. The Committee still adheres to its plan of a Committee on Professional Conduct to enforce the code, and in fact regards this as an essential requirement.

The proposed code is printed in full on page 271.

It is the belief of many now within the American Society of Mechanical Engineers that success is now not far off. The forces operating for the adoption of the code have now reinforcements from an entirely different direction. The Committee on Constitution and By-Laws of the Society was requested two years ago to present to the Society an entire revision of the constitution and by-laws. This Committee has incorporated in the constitution an article headed "Professional Practice," the first section of which reads:

In all professional and business relations the members of the Society shall be governed by the Code of Ethics of the Society.

This section of the constitution is supplemented by the following by-law:

All members of the Society shall subscribe to the following Code of Ethics as required by the constitution:

(Here is to be inserted the new Code of Ethics when adopted by the Society.)

There follows a second paragraph in the by-laws:

All matters in connection with the administration of the Code of Ethics shall be in charge of the Standing Committee on Professional Conduct under the direction of the Council.

The duties of the proposed new Standing Committee on Professional Conduct are prescribed in the following proposed new by-law:

The Standing Committee on Professional Conduct shall, under the direction of the Council, have supervision of all matters relating to the Code of Ethics and its enforcement, as required by the constitution, and as detailed in the rules. The Committee shall consist of five members and the term of one member shall expire at the close of each Annual Meeting.

These matters of the Constitution and by-laws are likewise to come before the Society at the forthcoming spring meeting.

The work on a Code of Ethics for Mechanical Engineers has, therefore, consumed twelve years to date, and has now the prospect of full realization.

Ethics of the Engineering Profession

By FREDERICK HAYNES NEWELL

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IN its ideals the engineering profession is not surpassed by those of any other group of public servants. In practice, however, because these ideals are so altruistic, it has been found difficult to reduce them to a brief statement and to secure general

agreement upon such statement. Most attempts to produce a brief code comparable with the Decalogue have resulted in little more than an expansion of the Golden Rule, such, for example, as is the code of ethics adopted by the American Society of